WATER USE IN COASTAL GEORGIA BY COUNTY AND SOURCE FOR 1997 AND TRENDS, 1980-97

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REFERENCE: Proceedings of the 1999 Georgia Water Resources Conference, held March 30-31, 1999, at the University of Georgia, Athens, Georgia., Kathryn J. Hatcher, *editor*, Institute of Ecology, The University of Georgia, Athens, Georgia.

Abstract. Water use during 1997 was estimated for each county in the 24-county area of coastal Georgia by water-use category, using data obtained from various Federal and State agencies. Categories of offstream water use include public supply, domestic, commercial, industrial, mining, irrigation, livestock, and thermoelectric power generation.

Total offstream water use from ground- and surface-water sources was estimated to be about 1,225 million gallons per day (Mgal/d) in 1997 for the study area, of which ground water supplied 28 percent and surface water supplied 72 percent. Water withdrawal in coastal Georgia increased from 1,153 Mgal/d in 1980 to 1,225 Mgal/d in 1997, a 6-percent increase. During this period, surface-water withdrawal increased by 111 Mgal/d and ground-water withdrawal decreased by 38 Mgal/d.

INTRODUCTION

Water resources in the 24-county coastal area of Georgia (fig. 1) are stressed because of population growth and from water demands for industrial and agricultural purposes. If withdrawal for thermoelectric power generation is excluded, about 69 percent of all withdrawal in the study area is from ground-water sources. Currently, management strategies are in place to protect these resources from increased pumpage and threats of salt-water contamination. Consistent and accurate water-use data are an essential component of these management plans. This report summarizes water use in coastal Georgia by source and water-use category for 1997, and describes water-use trends during 1980-97.

The Georgia Water-Use Program is a cooperative effort of the Georgia Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey, and the U.S. Geological Survey (USGS). The goal of the program is to collect, compile, and disseminate information on water use and to provide data needed by water managers, hydrologists, and others involved in managing, protecting, and investigating the water resources of Georgia. Water-use data are stored in the Georgia Water-Use Data System (GWUDS), a database maintained by the USGS. The Georgia Water-Use Program began in 1979: GWUDS stores available site-specific data from 1980 to the present.

1997 WATER USE

Offstream use is water withdrawn or diverted from a ground- or surface-water source, and transported to the place of use. The categories of offstream water use summarized in this paper include public supply, domestic, commercial, industrial, mining, irrigation, livestock, and thermoelectric power. Hydroelectric power generation is the only instream use compiled by the Georgia Water-Use Program (there are no hydroelectric power plants in the study area).

In coastal Georgia, an estimated 1,225 Mgal/d of water was withdrawn for offstream uses during 1997 (table 1). Excluding thermoelectric power generation, ground water was the principal source of water in the coastal area during 1997, and accounted for about 347 Mgal/d of the total withdrawal. Ground water accounted for over 50 percent of total withdrawal for 20 of the 24 coastal counties. Ground-water withdrawal was greatest in Chatham (76 Mgal/d), Glynn (65 Mgal/d), and Wayne Counties (64 Mgal/d). Surface water accounted for 72 percent of the total withdrawal in the coastal area (879 Mgal/d). The largest users of surface water were thermoelectric (726 Mgal/d), public supply (45 Mgal/d), and industry (79 Mgal/d).

The public-supply category includes water that is withdrawn by public and private water suppliers and delivered to various users for a variety of purposes, such as domestic, commercial, and industrial uses. Total public-supply water withdrawal was estimated to be 124 Mgal/d in 1997, of which ground water supplied about 63 percent and surface water supplied about 37 percent.

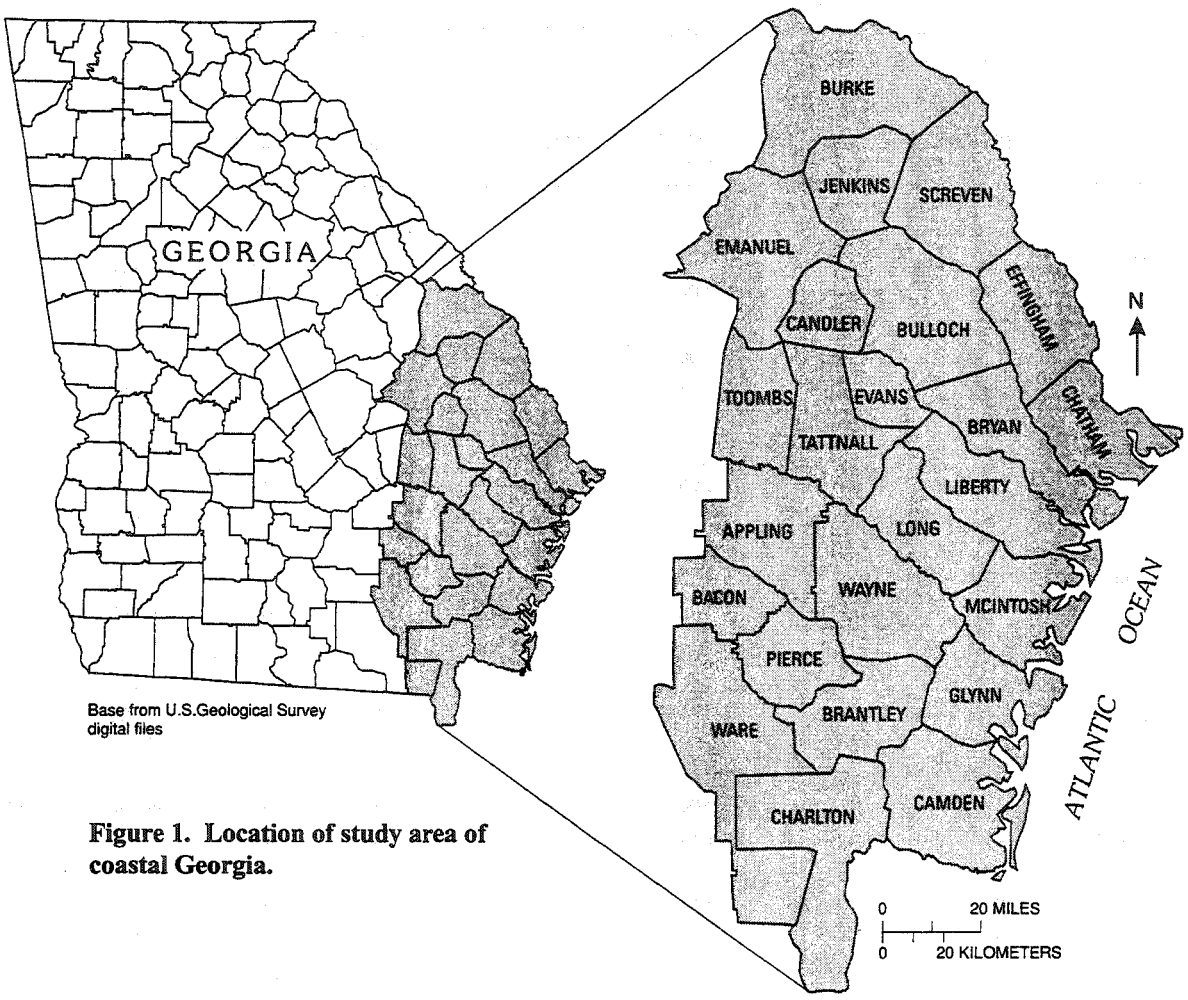

Figure 1. Location of study area of coastal Georgia.

Domestic use is defined as water used for household purposes. Most domestic water is supplied by public suppliers; however, some households—generally in rural areas—are supplied by individual water systems such as wells. Self-supplied domestic water use in 1997 was estimated to be 19 Mgal/d, derived mainly from ground water (wells and springs).

Commercial users include restaurants, hotels, retail stores, and other businesses; government and military facilities; prisons, schools, hospitals, and other institutions; and recreational facilities. Commercial use was estimated to be 14 Mgal/d in 1997, all of which was supplied by ground water.

Industrial water use includes water for such purposes as fabricating, processing, washing, and cooling in facilities that manufacture products. The largest industrial water users in Georgia are pulp and paper mills that are concentrated along the coast. Industrial withdrawal accounted for more than half of the withdrawal in coastal Georgia in 1997, if thermoelectric power withdrawal is excluded. Self-supplied industries in this area withdrew approximately 264 Mgal/d of water in 1997, 70 percent of which was from ground-water sources.

Mining water use is defined as water used for the extraction of naturally occurring minerals. In the study area, mining withdrawal was estimated at 0.2 Mgal/d in 1997, all from ground-water sources.

Irrigation water use includes water withdrawn for crops, large nurseries, athletic fields, and golf courses. In 1997, irrigation water use was estimated to be 72 Mgal/d in coastal Georgia, with 64 percent withdrawn from ground-water sources and 36 percent from surface-water sources.

Livestock water use is water withdrawn for poultry, horses, livestock, and catfish farms. Estimated livestock water use was 3 Mgal/d in the 24-county area in 1997, mostly from surface water sources (87 percent).

Thermoelectric power water use is water withdrawn for cooling purposes at thermoelectric power plants. The thermoelectric power category includes withdrawal by all self-supplied fossil fuel and nuclear facilities. In coastal Georgia there are four thermoelectric plants that

Table 1. Water use by county and source in coastal Georgia, 1997

County	Withdrawal, in million gallons per day							
	Source	Public supply	Domestic and commercial	Industrial and mining	Irrigation	Livestock	Thermoelectric	Totals
APPLING	GW	0.96	0.75	0.00	0.72	0.02	0.17	2.61
	SW	0.00	0.00	0.00	0.85	0.23	59.29	60.37
BACON	GW	0.46	0.48	0.21	1.23	0.01	0.00	2.39
	SW	0.00	0.00	0.00	0.24	0.09	0.00	0.33
BRANTLEY	GW	0.46	0.80	0.00	0.07	0.01	0.00	1.34
	SW	0.00	0.00	0.00	0.11	0.10	0.00	0.21
BRYAN	GW	1.31	0.97	0.00	0.14	0.00	0.00	2.42
	SW	0.00	0.00	0.00	0.07	0.01	0.00	0.08
BULLOCH	GW	2.92	1.75	0.91	6.16	0.04	0.00	11.78
	SW	0.00	0.00	0.00	3.05	0.22	0.00	3.26
BURKE	GW	1.17	0.96	0.00	7.08	0.03	0.78	10.02
	SW	0.68	0.00	0.00	1.87	0.15	62.83	65.53
CAMDEN	GW	3.03	2.86	31.06	3.17	0.00	0.00	40.12
	SW	0.00	0.00	7.74	0.00	0.01	0.00	7.75
CANDLER	GW	0.59	0.37	0.00	0.98	0.02	0.00	1.96
	SW	0.00	0.00	0.00	1.12	0.11	0.00	1.23
CHARLTON	GW	0.49	0.55	0.00	0.01	0.01	0.00	1.06
	SW	0.00	0.00	0.00	0.07	0.07	0.00	0.14
CHATHAM	GW	31.40	5.01	31.65	4.40	0.01	3.60	76.07
	SW	0.00	0.00	35.68	0.16	0.03	441.00	476.87
EFFINGHAM	GW	2.03	1.24	1.85	0.10	0.01	0.13	5.36
	SW	44.67	0.00	13.21	0.10	0.05	130.00	188.03
EMANUEL	GW	1.71	0.59	1.50	1.40	0.03	0.00	5.23
	SW	0.00	0.00	0.00	0.27	0.14	0.00	0.41
EVANS	GW	0.58	0.05	1.37	0.31	0.01	0.00	2.32
	SW	0.00	0.00	0.00	0.76	0.10	0.00	0.86
GLYNN	GW	12.72	4.84	45.26	2.47	0.00	0.03	65.33
	SW	0.00	0.00	22.90	0.00	0.01	32.56	55.47
JENKINS	GW	0.46	0.33	0.00	2.92	0.03	0.00	3.74
	SW	0.00	0.00	0.00	1.54	0.13	0.00	1.67
LIBERTY	GW	6.01	3.59	8.15	0.00	0.00	0.00	17.75
	SW	0.00	0.00	0.00	0.00	0.01	0.00	0.01
LONG	GW	0.28	0.33	0.00	0.03	0.00	0.00	0.64
	SW	0.00	0.00	0.00	0.15	0.04	0.00	0.19
MCINTOSH	GW	0.76	0.68	0.00	0.00	0.00	0.00	1.44
	SW	0.00	0.00	0.00	0.00	0.01	0.00	0.01
PIERCE	GW	0.50	0.98	0.00	2.61	0.02	0.00	4.10
	SW	0.00	0.00	0.00	1.81	0.09	0.00	1.90
SCREVEN	GW	1.14	0.73	1.86	3.24	0.03	0.00	7.00
	SW	0.00	0.00	0.00	1.36	0.14	0.00	1.50
TATTNALL	GW	1.16	1.84	0.00	6.66	0.03	0.00	9.69
	SW	0.00	0.00	0.00	8.19	0.58	0.00	8.77
TOOMBS	GW	2.67	0.53	0.00	1.31	0.03	0.00	4.54
	SW	0.00	0.00	0.00	2.89	0.09	0.00	2.98
WARE	GW	4.10	0.99	0.15	0.53	0.02	0.00	5.79
	SW	0.00	0.00	0.00	0.46	0.09	0.00	0.55
WAYNE	GW	1.72	1.01	60.59	0.71	0.01	0.00	64.04
	SW	0.00	0.00	0.00	0.53	0.05	0.00	0.58
STUDY AREA	GW	78.63	32.23	184.56	46.25	0.37	4.71	346.75
	SW	45.35	0.00	79.53	25.60	2.55	725.68	878.70

operate on fossil fuels, such as oil, coal, or natural gas; and two nuclear-powered plants. Withdrawal for thermoelectric power generation was estimated to be 730 Mgal/d in 1997, derived mostly from surface water sources (99 percent).

WATER USE TRENDS, 1980-97

Water withdrawal in the coastal area of Georgia increased from 1,153 Mgal/d in 1980 to 1,225 Mgal/d in 1997, a 6-percent increase (fig. 2). The largest increases were in Chatham (26 percent) and Effingham (27 percent) Counties. During 1980-97, withdrawal from surface-water sources in the coastal area increased about 111 Mgal/d and withdrawal from ground-water sources decreased by about 38 Mgal/d. Significant changes by category of use were reported in several counties:

- irrigation use in Tattnall County increased 85 percent from 1980 to 1997;
- industrial use in Camden and Glynn Counties decreased, owing to closing of chemical and paper plants, and to more efficient water-use practices at the existing plants; and
- industrial use in Effingham County increased by 96 percent from 1980 to 1997.

Throughout the period 1980-97, the relative amount of withdrawal by county did not change; the largest withdrawal was in Chatham County and the smallest, in Long County.

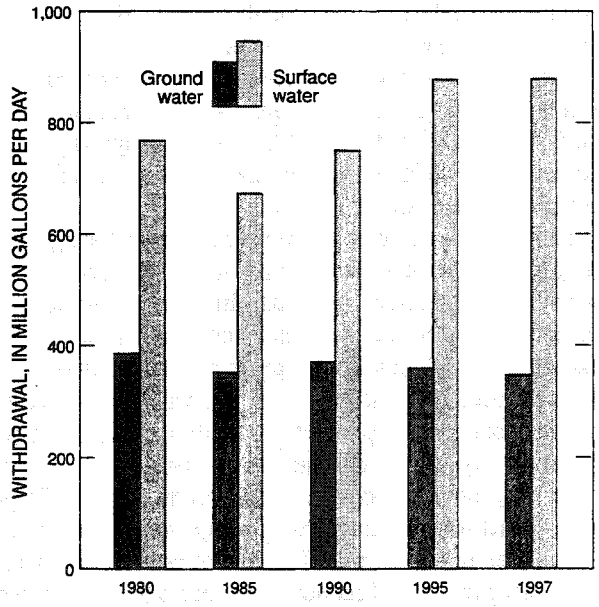

Figure 2. Water-use trends by source in coastal Georgia, 1980–97.

SUMMARY

Water-use data for the 24-county area of coastal Georgia for 1997 were compiled by the Georgia Water-Use Program. The data were compiled by county and by category of offstream water use—public supply, domestic and commercial, industrial and mining, irrigation, livestock, and thermoelectric power generation.

In coastal Georgia, an estimated 1,225 Mgal/d was withdrawn for offstream uses during 1997. Excluding thermoelectric, ground water was the main source of water in the coastal area during 1997, providing about 347 Mgal/d of the total withdrawal. Surface water provided 72 percent of the total withdrawal in the coastal area (879 Mgal/d).

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